

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-22 (Canceled)

23-27 (Previously Canceled)

28. (Currently Amended) *Chlamydomonas reinhardtii* Strain 6 deposited with the Culture Collection of Algae and Protozoa (CCAP) on 1 July 2003 under CCAP Culture Collection of Algae and Protozoa accession number 11/129.

29. (Canceled)

30. (New) A mutant alga capable of hydrogen production under illuminated conditions through action of a hydrogenase, where the hydrogenase comprises HydA, and the alga having a mutation that reduces or eliminates activity of a mitochondrial transcription factor, where the mitochondrial transcription factor comprises Moc1, whereby said alga has increased hydrogen production compared to wild-type alga.

31. (New) A mutant alga as claimed in claim 30 wherein the alga is a green alga.

32. (New) A mutant alga as claimed in claim 31 selected from the group consisting of *Chlorococcales* and *Volvocales*.

33. (New) A mutant alga as claimed in claim 32 which is from *Volvocales*.
34. (New) A mutant alga as claimed in claim 33 wherein the alga is selected from the group consisting of *Chlamydomonas spp.*, *Scenedesmus spp.*, *Chlorococcum spp.*, *Chlorella spp.*, *Platymonas spp.*, and *Trichomonas spp.*
35. (New) A mutant alga as claimed in claim 34 wherein the alga is of *Chlamydomonas spp.*
36. (New) A mutant alga as claimed in claim 35 wherein the alga is *Chlamydomonas reinhardtii*.
37. (New) A mutant alga as claimed in claim 36 which is, *Chlamydomonas reinhardtii* Stm deposited with the Culture Collection of Algae and Protozoa on 1 July 2003 under accession number 11/129.
38. (New) A substantially pure culture of a mutant alga capable of hydrogen production under illuminated conditions through the action of a hydrogenase, where the hydrogenase comprises HydA, and having a mutation that reduces or eliminates the activity of a mitochondrial transcription factor, where the mitochondrial transcription factor is comprises Moc1, whereby said alga has increased hydrogen production compared to wild-type alga.
39. (New) A substantially pure culture as claimed in claim 38 wherein the alga is one of a green alga.
40. (New) A substantially pure culture as claimed in claim 39 wherein the alga is selected from the group consisting of *Chlorococcales* and *Volvocales*.

41. (New) A substantially pure culture as claimed in 40 wherein the alga is from *Volvocales*.
42. (New) A substantially pure culture as claimed in claim 41 wherein the alga is selected from the group consisting of *Chlamydomonas spp.*, *Scenedesmus spp.*, *Chlorococcum spp.*, *Chlorella spp.*, *Platymonas spp.*, and *Trichomonas spp.*
43. (New) A substantially pure culture as claimed in claim 42 wherein the alga is of *Chlamydomonas spp.*
44. (New) A substantially pure culture as claimed in claim 43 wherein the alga is *Chlamydomonas reinhardtii*.
45. (New) A substantially pure culture of *Chlamydomonas reinhardtii Stm6* deposited with the Culture Collection of Algae and Protozoa on 1 July 2003 under accession number 11/129.